

WATER QUALITY										
ACTION			LEAD	CONTRIBUTOR	COLLABORATOR	WHAT WILL YOU DO / DELIVER?	STATUS 7-18-06	STATUS 2-14-07	STATUS 7-10-07	KEY NEXT STEPS
Complete	On Track	Not On Track								
WQ-1: Improve harmful algal bloom detection and forecasting in the U.S. and Mexican Gulf States										
36 Month Outcomes: <ul style="list-style-type: none">• Improve the current HAB Forecasting System off the Southwest Florida coast to better identify the onset of blooms and better predict the transport of blooms.• Develop a satellite detection, forecasting, and Internet-based notification capability for <i>K. brevis</i> off the southern coast of Texas.• Develop a satellite detection and Internet-based notification capability for <i>K. brevis</i> off the coast of the Mexican Gulf state of Veracruz. Action Blueprint:										
1. Improve the operational HAB Forecasting System off the Southwest Florida coast to better identify the onset of blooms and better predict the transport of blooms.			Florida, NOAA	NASA, NRL		FL will help coordinate the implementation of an improved HABs Forecasting System off the Southwest Florida coast. NOAA will improve its current HAB Forecasting System off the Southwest Florida coast (see: http://www.csc.noaa.gov/crs/habf/) to better identify the onset of blooms and better predict the transport of blooms. (Lead: NOS NCCOS) NASA has a cooperative agreement with the US Naval Research Laboratory to increase the availability of NASA data and NRL remote sensing techniques to the operational HAB forecasting system. Project results will be available to the Alliance.	(1) NOAA deployed two Brevebuster sensors at nearshore platforms in Venice and Naples. (2) The State of Florida and NOAA deployed three autonomous underwater gliders with Brevebuster sensors in April 2006, to better detect blooms offshore. (3) NOAA is currently developing a 2-D model to better forecast the tranport of existing blooms within the HABs Forecasting System. (4) NASA, NOAA, and the Naval Research Laboratory (NRL) collaborated on new data products for HABSOS decision support. These products are derived from NASA imagery and NRL modeling capabilities, providing coastal resource managers detailed information on tracking turbidity plumes and chlorophyll anomalies. NASA and NOAA are developing an implementation plan to transition these new capabilities to NOAA and HABSOS project. (5) FL FWC and Mote Marine Lab have funded the Florida COOS-Caucus to plan and design an improved ocean observing network toward improving red tide tracking and prediction.	(6) 2006 Accomplishments: Access to NGOM model output to improve bloom initiation is being provided by NOAA/NOS in real-time. Validation of accuracy is ongoing. Paper regarding model was published (Lanerolle et al., 2006). Coupled NGOM and NWFS models for 3-D development of bloom was developed by NOAA/NOS and is being evaluated. Visualization and evaluation tools for comparison of models have been developed by NOAA/NOS. NOAA/NOS developed a seabreeze model to aid in forecasting impacts. Real-time monitoring system using lifeguards in Sarasota County was developed by Mote Marine Laboratory. Real-time data is provided using blackberry technology. A real-time respiratory irritation monitoring website was established. Brevebuster data (from AUVs and Moorings) are now available through Google/Earth by Mote Marine Laboratory. (7) The NCCOS Southeast Phytoplankton Monitoring Network has enhanced its Gulf of Mexico monitoring efforts to include Alabama, which will support NOAA's HAB Forecast by providing new regional coverage and seasonal abundance data for the toxic dinoflagellate <i>Karenia</i>	(7) Update from D. Whittall.	
2. Conduct an interagency workshop to review scientific advances related to red tide in the Gulf of Mexico and identify future priorities for the region.			NOAA, Florida		Louisiana	NOAA and FL will convene a workshop to review scientific achievements in understanding red tide and developing methods to mitigate the impacts of red tide on Gulf States (Lead: NOS NCCOS). LA will participate to the extent practicable in a review capacity and will attend workshop as time and funding allows. (Lead: LDEQ)	(1) NOAA, Mote Marine Lab, and FWRI hosted a workshop in Sarasota, Florida, on July 17-20, 2006, to discuss current red tide research efforts and address areas that need further exploration (called the State of Research on Red Tide in the Gulf of Mexico Workshop). Seventy-five national and international scientists and managers participated, including two red tide researchers from Mexico. By sharing opinions and concerns via an online survey and in three simultaneous public meetings along the SW Florida coast on July 20, the public played an integral role in the direction of future red tide research efforts.	(2) A workshop report and a special issue of a journal are being prepared. (NCCOS)		STEP COMPLETE

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3. Hold workshops with local, state, and federal expert scientists to train personnel in HAB field sampling and microscopic identification methods and to demonstrate toxin-detection methods.			Florida, EPA	FDA	Alabama, Louisiana, Mississippi, Texas	FL will co-lead these workshops. (Lead: Florida HAB Task Force and FDEP CAMA) EPA will co-lead and co-sponsor (i.e., resources and administration) the design, development, and implementation of these workshops. FDA will provide training in field and lab methods for phytoplankton and for toxins. AL will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow. (Lead: ADEM) LA will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow. (Lead: LDEQ) MS will send staff to participate. TX will consider hosting a 2007 training workshop.	(1) FL Fish and Wildlife hosted a phytoplankton identification training session in St. Petersburg June 7-9, 2006 (Workshop organizer Jennifer Wolny) with participants from TX, LA, AL, and FL. It was very beneficial in terms of education (scope included toxic species of Protoperidinium, Karenia, and Prorocentrum; cyanobacteria, and flagellates) and networking to improve communication across the coast. We now have contacts in all five states for our informal alert system. Karen Steidinger alluded to holding another session next year and I hope it will include a bit more toxin training. (2) FL DEP is leading a study of LC/MS and ELISA methods of microcystin (cyanobacter) toxin measurement to assess proper holding times and determine best methods and comparability of methods for analysis of the toxins. (3) FDA has identified the molluscan metabolites of parent brevetoxins from K. brevis and developed a confirmatory liquid chromatography - mass spectrometric (LC/MS-MS) method for the most common (across spp.) of these metabolites (i.e. Markers of exposure). FDA is now leading the	(4) EPA funded a cooperative agreement with the USF College of Marine Sciences (Frank Muller-Karger) to conduct HAB identification training for Veracruz personnel in Summer 2007. (GMP) (5) The Southeast Phytoplankton Monitoring Network (SEPMN), supported by NOAA, promotes a better understanding of HABs by way of volunteer monitoring. SEPMN hosted a Gulf Coast Training for volunteers from MS, AL, and LA on February 6, 2007. A training session for volunteers from Texas is planned for Spring 2007. (NCDDC and NCCOS)	(6) FFWCC completed a 2nd class June 12-15, 2007, with participants from all five Gulf States.	(1) TX will consider hosting a 2007 training workshop, and solicit sepcific training topics (D. Buzan). (2) All materials will be translated into Spanish, and FWRI will host a phytoplankton identification workshop in 2007 for Mexican scientists. (M. Neely) (3) FWRI will host a phytoplankton ID workshop in 2008 somewhere in the US. (M. Neely)
4. Advance technologies for rapid field screening and enhanced real-time remote sensing, platform sensing, and autonomous sensing of HABs.			NOAA		Louisiana, USACE, NASA, EPA	NOAA will test and provide the Alliance and GCOOS with the results of in situ optical HAB detection (off Corpus Christi and along West Florida Shelf (WFS), enhanced nearshore real-time remote sensing systems on WFS, and autonomous sensing to provide early warning of HABs for Texas and Florida (Lead: NOS NCCOS) USACE will contribute information and technologies from existing and future remote sensing platforms installed to analyze releases from Lake Okechobee relative to HAB. NASA will identify and provide results from previously funded and underway projects addressing remote sensing of HABs. EPA will assist in coordinating federal investments in advanced field screening technologies (e.g., NSF funded autonomous sensor development programs underway at the Mote Marine Lab). LA will provide in-kind support as resources will allow.	(1) NOAA (ECOHAB, MERHAB), EPA, NSF, ONR, and NASA have supported research on the optical characteristics of K. brevis, which has led to an in-water optical sensor that detects blooms in situ in real time. NOAA is now supporting research to demonstrate the operational capabilities of the sensor on ship board for mapping, on moorings to provide early warning, and on AUVs to confirm blooms that have been detected by satellite remote sensing. (2) The BreveBuster is a sensor that can detect the toxic algae, Karenia brevis (commonly known as the red tide organism), in coastal waters. With close collaboration between the State of Florida and NOAA, three such sensors were deployed on autonomous underwater gliders off the Southwest coast of Florida in April 2006. This effort greatly enhances the ability to identify the onset of blooms and better predict the transport of blooms. (3) NASA, NOAA, and NRL collaborated on new data products for HABSOS decision support. These products are derived from NASA imagery and NRL modeling capabilities, providing coastal resource managers detailed information on tracking	(4) In November 2006, NOAA tested an AUV and water quality sensor that may improve shallow water monitoring of estuaries and coastal oceans. Tests in North Carolina yielded data on pH, dissolved oxygen, salinity, temperature, depth, turbidity, and fluorescence every 2 seconds for missions lasting from 40 minutes to 2.5 hours. The AUV, 20 pounds in total weight, was directed by acoustic signals or navigated autonomously via an internal GPS and pre-entered way points of latitude and longitude. (NCCOS) (5) EPA funded NOAA NDBC in January 2007 to deploy two coastal meteorological (C-MAN) stations and three BreveBuster sensors in the vicinity of Veracruz, Mexico, in late spring/summer. (6) NOAA is funding research to test and provide the Alliance and GCOOS with the results of in situ optical HAB detection (off Corpus Christi and along WFS), enhanced nearshore real-time remote sensing systems on WFS, and autonomous sensing to provide early warning of HABs for Texas and Florida. (NCCOS)	(7) FL GR (Technology) is sponsoring FWRI, FIO, USF, UMd, AMJ Equipment, Wetlabs to purchase instrumentation for red tide monitoring technology support (red tide molecular probes, SEM, etc.), construction and deployment of brevebusters and maintenance of soCool center, construction of 2 automated urea analyzers for water quality monitoring on MARVIN platforms, construction of an autonomous water quality monitoring platform (MARVIN III), maintenance and repairs of Marvin I and II, nitrate analyzer for Marvin I, drifter deployments to track red tide movements, fluorometer for Chlorophyll detection in USF BSOP's during red tides. (8) FL GR (Extended Red Tide Monitoring) is sponsoring MOTE, FSU, FGCU, FIO, UF, UNCWilmington, USF to extend red tide monitoring network, research red tide impacts on biomarkers in dolphins, marine vertebrate immune systems, fisheries and stock enhancement, bacteria and trophic transfer of brevetoxins in shellfish; physical and biological monitoring of red tides in the big bend area, monitoring of red tide in the NW Everglades and adjacent coastal areas, Suncoaster shiptime, coord	

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5. Independently evaluate and compare the multiple methods of HAB detection technologies under development for <i>K. brevis</i> against microscopic identification methods.			Florida, EPA		Louisiana, Mississippi	FL will co-lead this evaluation. (Lead: Florida HAB Task Force) EPA, with resources from the EPA Advanced Monitoring Initiative (AMI), will team with project partners to technically support the evaluation of detection methodologies. MS will provide in-kind assistance. LA will provide in-kind support as resources will allow.	(1) Tammi Richardson and Jay Pinkney of the University of South Carolina held a <i>Karenia brevis</i> quantification by pigment detection workshop in March 2006. Though the methods needs refinement it may be considered in the methods evaluation objective. Participants from TX, MS, AL and FL worked in Columbia, SC for four days extracting and measuring pigments by HPLC.	(2) As a component of a NOAA MERHAB grant to FWC/FWRI (the FY02 Eastern Gulf of Mexico Senitnel Program), three <i>Karenia</i> detection technologies have been directly compared in dedicated research cruises in November of 2003, September and November of 2004 and 2005 and September, October and November of 2006: direct microscopic enumeration, molecular probes (FWRI sandwich hybridization RNA probes for <i>Karenia brevis</i> , <i>Karenia mikimotoi</i> , <i>Karenia papilionacea</i> and <i>Karenia selliformis</i>) and an optical detector (the Mote 'BreveBuster'). An ongoing comparison of RNA based molecular probe results with concurrent monitoring microscopic counts was also initiated within the HAB monitoring program at FWRI in August of 2006.	(3) Proposal to FWRI was not funded. (M. Neely)	
6. Conduct studies to determine the public health, natural resources, and socioeconomic impacts of HABs in the Gulf region.			EPA	NOAA	NSF, Louisiana, Mississippi	EPA will work in collaboration with key State and Federal partners throughout the region to assess the public health, natural resource, and economic risks and impacts from HABs. The initial study will be concluded within 24 months of the initiation of this plan and updated on a periodic basis as determined by the Alliance. NSF could possibly fund such studies, but the agency's ability to support proposed research and studies is dependent on the submission of proposals and peer review of those proposals. NOAA will fund research to improve the prediction of potential respiratory irritation at specific Gulf of Mexico beaches; to validate ELISA for use as a regulatory alternative for shellfish monitoring and to determine toxin impacts on marine mammals (Lead: NOS NCCOS) LA will provide in-kind support as resources will allow. MS will provide in-kind assistance.	(1) FL-CDC studies on health impacts off coast of SW Florida (more info from B. Bibler). (2) Mote study on hospital admissions by B. Kilpatrick. (3) GMNET incident-reporting database system effort has fallen by the wayside (no funding to support) (S. Jordon).	(4) NOAA is funding research to understand the accumulation of brevetoxins in shellfish; to validate ELISA for use as a regulatory alternative for shellfish monitoring; and to determine toxin impacts on marine mammals. (NCCOS)	Interstate Shellfish Sanitation Conference for acceptance of the ELISA and LC-MS as Type I analytical methods to replace the mouse bioassay for brevetoxins in shellfish. (C. Dorsey) (6) FL GR (Extended Red Tide Monitoring) is sponsoring MOTE, FSU, FGCU, FIO, UF, UNCWilmington, USF to extend red tide monitoring network, research red tide impacts on biomarkers in dolphins, marine vertebrate immune systems, fisheries and stock enhancement, bacteria and trophic transfer of brevetoxins in shellfish; physical and biological monitoring of red tides in the big bend area, monitoring of red tide in the NW Everglades and adjacent coastal areas, Suncoaster shiptime, coordination and implementation of ocean observing system, development of sampling strategies for assessment of red tide frequency and intensity (statistical interpretations of HAB database), purchase of ELISA toxin kits in support of red tide shellfish monitoring, purchase and deployment of drifter buoys in support of tracking red tide blooms, support for satellite downl	(1) TX applying for NIEHS funds to study public health impacts off of Texas coast (D. Buzan). (2) Alliance membership should consider applying for EPA GoMex funds to revive the GMNET system (S. Jordon). (3) The document "Harmful Algal Research and Response: A Human Dimensions Strategy - Following the Recommendations of the National Plan for Algal Toxins and Harmful Algal Blooms" (Bauer, M., ed. 2006) outlines a research strategy for public health, natural resource, and socioeconomic impacts (C. Dorsey).
7. Test and provide the Alliance and GCOOS with the results of an in situ optical early warning HABs system off the coast at Corpus Christi, Texas.			NOAA		EPA	NOAA will test and provide the Alliance and GCOOS with the results of an in situ optical early warning HABs system off the coast at Corpus Christi, Texas (Lead: NOS NCCOS).	(1) A NOAA MERHAB funded project (FY02, In Situ Optical Early Warning System to Detect Harmful Algal Blooms, PI Lisa Campbell, TAMU) to monitor <i>K. brevis</i> using a novel optical detection system, the FlowCAM (Flow Imaging Technologies, Inc.) in conjunction with the existing Texas Automated Buoy System (TABS) has met technological problems; however trying this technology on a pier with more success.	(2) NOAA-funded researchers have tested and will provide the Alliance and GCOOS with the results of an in situ optical early warning HABs system off the coast at Corpus Christi, Texas	(3) NOAA update from D. Whittall.	

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8. Fund research into relationship between anthropogenic activities and planktonic cell counts, environmental conditions that lead to bloom conditions, and testing new HAB detection and tracking technologies for routine use in observation, monitoring and forecasting programs.			NOAA Identification of Lead still pending.	Florida NOAA		Through the Ecology and Oceanography of HABs (ECOHAB) and Monitoring and Event Response for HABs (MERHAB) programs, NOAA will conduct targeted Gulf of Mexico research on the detection, causes, and dynamics of HABs, forecasting growth, transport, and toxicity, and transfer new technologies to enhance Gulf of Mexico HAB monitoring and forecasting programs. ECOHAB and MERHAB research projects will predict and ameliorate HAB impacts on higher trophic levels and humans. (Lead: NOS NCCOS)	(1) FL and TX have volunteer HABs monitoring programs underway for tracking purposes (D. Buzan). (2) FL water management districts funds for local monitoring from Lake O. discharge (S. Wolfe). (3) LUMCON has an ongoing program to monitor algal species in the Barataria-Terrebonne estuary; EPA GMP is funding a compilation of these data (F. Kopfler) (4) TAMU boat mounted "dataflow system" monitors water chemistry and cholophyll and relating to inflow and other anthropogenic activities (D. Buzan).	(5) In November 2006, NOAA awarded a \$4.7 million, five-year ECOHAB grant to the FFWCC FWRI and collaborators at Mote Marine Laboratory, University of Miami RSMAS, University of South Florida, Virginia Institute of Marine Science, Old Dominion University, and University of Maryland, to examine the causes of red tide (K. brevis) along Florida's Gulf Coast, especially how and what types of nutrients fuel the blooms. The new research, which will combine biological, chemical, and physical measurements with predictive modeling efforts, seeks to address a critical knowledge gap using both experimental and modeling approaches, as well as retrospective data analysis. Investigators also will seek to identify alternatives for coastal managers. (6) NOAA has identified a gene of K. brevis responsible for the detection of blue light that may play a key role in regulating its ability to grow and form blooms. Knowledge of physiological processes in harmful algae is critical for developing field indicators of HAB progression that will facilitate improved predictive models of bloom impacts. (NCCOS) (7) Through ECOHAB and MERHAB, NOAA-funded	(8) Through NOAA MERHAB, USF/Mote Marine Lab, FIO, and FWRI are coordinating and implementing new red tide detection technologies, buoy maintenance, a bottom-stationed ocean profiler, red tide model development, brevebuster development and deployment, shiptime, development of molecular probe for Dinoflagellate ID (including multiple Karenia species), and HPLC analyses within red tides. (9) Through NOAA ECOHAB, USF/Mote Marine Lab, UMiami, UMd, VIMS, ODU, FIO, and FWRI are coordinating and implementing studies on Karenia nutrient dynamics in the GOM, development and implementation of coupled biophysical model of Florida Red tide, external nutrient sources and red tide dynamics in nearshore environments, lagrangian based, measurements of primary production, red tide grazer and microbial nutrient dynamics, Karenia nitrogen nutrition dissolved nitrogen uptake, regeneration, and photochemical processes, Karenia nitrogen nutrition nitrogen fixation and enzymatic mediated processes, and shiptime. (10) Mote Marine Lab has an ongoing analysis of brevetoxins in stranded dolphins, sea turtles and b (11) The GOMFMC is sponsoring the monitoring of	
9. Collaborate with existing Gulf State programs to inform and educate the public about HABs and management actions taken to protect public health; expand educational and outreach methods used to inform the public about HABs and their impacts.			EPA	Florida, USFWS	Louisiana, Mississippi, NSF	EPA will team with additional partners and work with the Alliance Education Network Coordinator to develop and implement a strategic outreach plan for this action. USFWS will assist in educating the public about HABs and their impacts at its coastal National Wildlife Refuges. FL will integrate HAB information into community education programs. (Lead: FDEP CAMA) The NSF-funded COSEE Centers located on the Gulf Coast could serve as a point of dissemination for such information (which would be coordinated through the Centers themselves, not through NSF). MS will provide in-kind assistance. LA will provide in-kind support as resources will allow.	(1) FL and TX have HABs webpages.	(2) Florida DEP RBNEER hosted a workshop on January 23 and 24 to address local red tide issues. The workshop included a day of in-depth scientific presentations to review impacts of red tide on human health and the local economy, followed by break-out sessions encouraging participants to brainstorm potential action items for dealing with red tide at the local level. Around 110 people participated in the workshop, and an even larger audience will be reached through a two-segment documentary film being produced by Comcast Cable to air on their local channel in the coming month. Partners included NOAA, Florida Coastal Management Program, Florida Gulf Coast University, Naples Daily News, Naples Chamber of Commerce, and ComCast Cable Television. (3) Texas Sea Grant and other state agencies developed a red tide information card that lists top 10 red tide facts, including health and seafood safety tips and how to recognize and report a red tide, targeted to coastal residents and tourists. The initial printing was 100,000 cards.		(1) The WQ PIT will work with the EEN for implementation.

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10. Implement an operational HAB forecasting capability of the South Texas coast.			NOAA, Texas		NASA, NRL	NOAA will conduct required research to develop an operational HAB Forecasting System for the western Gulf of Mexico. (Lead: NOS NCCOS) TX will help coordinate the development of an operational HAB forecasting capability off the coast of Texas. (Lead: TPWD)	(1) Three meetings were held in July 2006 to meet with members of the local chamber of commerce, tourism agencies and health departments about plans to provide harmful algal bloom (HAB) bulletins and public advisories for the coast of Texas. In collaboration with the Texas Parks and Wildlife Department (TPWD), NOAA will demonstrate an operational capability for HAB bulletins for Texas in October 2006. The purpose of these meetings was to educate the participants about HABs and their impacts, inform them of NOAA HAB forecasts, as well as answer any questions and alleviate any concerns the participants may have about providing public health impact information to the public.	(2) On September 12, 2006, NOAA issued the first Harmful Algal Bloom (HAB) Bulletin for the south Texas coast, kicking off the demonstration of a new operational capability for the western Gulf of Mexico. Both NOAA and Texas Parks and Wildlife Department (TPWD) staff received training over the past four months to build analytical competencies that will produce a "confident" bulletin. (3) NOAA has expanded its network of volunteers trained to sample and microscopically analyze coastal water for plankton that may cause harmful algal blooms (HABS). Data generated by Texas volunteers of NOAA's Southeast Phytoplankton Monitoring Network support the NOAA HAB Forecast by providing distribution and seasonal abundance of the toxic dinoflagellate, Karenia brevis, critical for the validation of the forecast. (NCCOS) (4) The Texas Red Tide Rangers, a South Padre Island volunteer group, collects water samples and identifies red tide cells under the microscope, data that were incorporated into daily red tide updates posted on the web. Over the two-month duration of the bloom, the Rangers collected and a		STEP COMPLETE (1) MS would like to develop a detection capability (H. Folmar).
11. Develop a satellite detection and Internet-based notification capability for <i>K. brevis</i> off the coast of the Mexican Gulf state of Veracruz.			EPA	NASA, NRL, NOAA, Papaloapan River Basin Development Council (Veracruz)	GCOOS, Gulf of Mexico States Accord, State Department	EPA, with resources from the EPA Advanced Monitoring Initiative (AMI), will team with project partners including the Gulf of Mexico States Accord's Veracruz representatives to develop a satellite detection and Internet-based notification capability off the coast of Veracruz, Mexico. EPA will work in collaboration with the GCOOS Regional Association and State Department to help integrate and standardize the efforts undertaken in Veracruz with those utilized in the southwest Texas and South Florida components of Action WQ-1. State Department will facilitate, as appropriate, contacts with Mexican federal and state officials to explore their interest in participating in project activities, according to guidance from the Alliance.	(1) The HABSOS Program is supported through collaborative efforts of EPA, NOAA, GMP, NRL, National Association of Marine Laboratories, U.S. Integrated Ocean Observing System, and the five U.S. Gulf States. In January 2006, the GMP was awarded FY06-07 funds through the EPA Advanced Monitoring Initiative (AMI) to support the expansion of HABSOS into Mexico. Working in close partnership with Consejo de Desarrollo del Papalopapan (CODEPAP), the project will support the installation of two coastal meteorological stations and three <i>K. brevis</i> (the red tide organism) BreveBuster sensors in the vicinity of Veracruz, Mexico. EPA, NOAA, NASA, and NRL will develop methods to employ ocean color imagery for HAB detection. The project will provide a bi-national web-based data management and communications system to expand the capabilities of coastal resource agencies to rapidly collect and disseminate data and information on HABs event and related environmental factors.	(2) On August 15-16, 2006, a joint project team delegation from NOAA NDBC, EPA GMP, and EPA's GED Lab met in Xalapa, Mexico, with officials from the Institute of Ecology and the Veracruz Department of Health to begin the scheduling for the deployment of 2 C-MAN and 3 integrated Brevebuster sensor stations along the Veracruz coastline. Current plans involve the deployment of the sensors this winter followed up by technical training on sensor maintenance, in-situ sampling, analysis, data reporting and, bulletining system utilization for the Veracruz project team in the spring and summer of 2007. (3) EPA funded NOAA NDBC in January 2007 to deploy 2 coastal meteorological (C-MAN) stations and 3 BreveBuster sensors in the vicinity of Veracruz, Mexico, in late spring/summer. (4) NRL has provided Veracruz area imagery products, currently hosted on online by NOAA NCDDC, with more to come. NRL has also provided a high resolution 7-day animation loop for Veracruz. (GMP) (5) NOAA is developing a Spanish language HABs data entry tool and ArcIMS in support of Veracruz project; available March 2007. (NCDDC)	(6) Everything is on track, but the deployments have been delayed until all of the equipment is available. The National Buoy Data Center will handle the deployments and calibrations. (B. Fisher, EPA)	

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12. Install meteorological stations in the near coastal zone where required to forecast surface currents.			EPA	NOAA	Louisiana, Mississippi	EPA, with resources from the EPA Advanced Monitoring Initiative (AMI), will team with project partners including the Gulf of Mexico States Accord's Veracruz representatives to support the installation and pilot operation of 2 pilot meterological stations off the coast of Veracruz, Mexico. NOAA will provide meteorological observations from National Water Level Observation Network stations that have meteorological sensors.(Lead: NOS CO-OPS) MS will provide in-kind assistance. LA will coordinate as resources will allow.	(1) EPA and NOAA will install two meteorological stations off the coast of Vercruz to support the development of a satellite and notification capability for K. brevis (M. Magee).	(2) EPA funded NOAA NDBC in January 2007 to deploy 2 coastal meteorological (C-MAN) stations and 3 BreveBuster sensors in the vicinity of Veracruz, Mexico, in late spring/summer. NDBC is currently building the C-MAN stations.	(3) Everything is on track, but the deployments have been delayed until all of the equipment is available. The National Buoy Data Center will handle the deployments and calibrations. (B. Fisher, EPA)	
WQ-2: Improve beach water quality management										
36-month outcomes: <ul style="list-style-type: none">Conduct a peer-reviewed field evaluation of current bacterial source tracking capabilities in an estuarine recreational area, and select two methodologies for intensive field testing/validation.Implement pilot testing of these two methods in five Gulf of Mexico estuaries with varying environmental conditions (preferably one location in each Gulf state). Action Blueprint:										
						REFINED OUTCOME (7-18-06) The "product" of WQ-2 is a tool to help regulatory agencies identify sources of microbial pollution, as this contamination relates to human health. The primary product should distinguish human versus non-human sources. Distinguishing among sources of non-human contamination is an important secondary focus to assist the TMDL process. WQ-2 is laid out as a sequence of dependent steps, and the Step 1 workshop should be used to more definitively define the product and scope of the evaluation (Step 2-6). The WQ PIT is counting on a proposal to the GMP Alliance RFP to accomplish WQ-2, but have several grant conditions: (1) State WQ, health, and shellfish representatives must be involved in the workshop process (to design evaluation and consider results of evaluations); (2) The field evaluations must demonstrate effective methods in shellfish growing waters and primary contact marine recreational waters (i.e., beaches); and (3) Any contract needs to maintain GOMA oversight of experimental design steps.				
1. Conduct a "state of the Gulf" workshop on pathogen indicators in recreational marine waters, epidemiological correlations, and microbial source tracking research, with an endpoint of selecting the site and designing the study and the parameters for evaluation.			EPA	USGS, NOAA, Mississippi	Alabama, Louisiana, FDA, NSF	EPA, via an existing Congressionally authorized and appropriated agreement, with the University of Southern Mississippi to assist in such actions, will design and implement this workshop. Additionally, EPA, through its oversight regions in the Gulf (Regions 4 & 6), will provide policy advice and technical assistance to these actions. NOAA will participate in the marine pathogen workshop, if asked by the Alliance (Lead: NOS NCCOS) NOAA will contribute to the Alliance the results of an active research program in BST, specifically tracking fecal coliform to human, wildlife or domestic animal sources. (Lead: NOS NCCOS) USGS will provide experience in BST methods and in forecasting beach contamination. MS will provide in-kind support and financial assistance. NSF will send a representative to the workshop. AL will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow. (Lead: ADEM) LA will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow. Indicator methods are being developed by FDA and FDA will pe	(1) Dr. RD Ellender of the University of Southern Mississippi is organizing a meeting on December 6-8, 2006 in Biloxi with finicial support from the US EPA to network the practioners of microbial source tracking in the Gulf region.	(2) Over 40 participants, including national scientific experts, state water quality managers, state beach managers, and state shellfish growing water managers, convened for an Alliance-sponsored, December 6-8, 2006, workshop in Biloxi, Mississippi entitled "Microbial Source Tracking in the Gulf of Mexico: Implications for Health and Environmental Management". Participants discussed various multiple source tracking methods and the regulatory and management context for applying these methods, and then identified the three most promising methods for field evaluation at Gulf beaches and shellfish growing waters. The agenda, presentations, the list of participants, and summary report available at www.usm.edu/bst/ .		STEP COMPLETE
2. Conduct a comprehensive field evaluation of current bacterial source tracking capabilities.			EPA	Mississippi	Alabama, Louisiana, FDA	EPA will provide technical assistance to this action. MS will provide in-kind assistance. Alabama will collect samples when stations are consistent with other program sampling activities. (Lead: ADEM) Louisiana will participate as resources will allow. FDA will contribute results of recently-started field studies using traditional indicators, male-specific bacteriophage, and direct measure of norovirus.		(1) Peter Hartel (UGA) and Chuck Hagedorn (VPI) invited the Gulf States to participate in an interstate fluorometry protocol development study using a handheld fluorometer. (Updated 1/16/07) (2) EPA has funded a cooperative agreement with USF, USM, and UWF (PIs are Harwood, Ellender, Wang, and Lepo) to accomplish this step.	Update from Harwood / Ellender.	

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ACTION			LEAD	CONTRIBUTOR	COLLABORATOR	WHAT WILL YOU DO / DELIVER?	STATUS 7-18-06	STATUS 2-14-07	STATUS 7-10-07	KEY NEXT STEPS
Complete	On Track	Not On Track								
3. Conduct a workshop to evaluate the field evaluation results and select two methods for use in the pilot studies; select the pilot study areas.			EPA	Mississippi	Alabama, Louisiana, USGS, FDA	EPA, via an existing agreement with the University of Southern Mississippi to assist in such actions, will design and implement this workshop. Additionally, EPA, through its oversight regions in the Gulf (Regions 4 & 6), will provide policy advice and technical assistance to these actions. MS will provide in-kind assistance. USGS will provide expertise in study design and analytical methods. Alabama will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow. (Lead: ADEM) LA will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow. FDA will participate in this workshop.		(1) EPA has funded a cooperative agreement with USF, USM, and UWF (PIs are Harwood, Ellender, Wang, and Lepo) to accomplish this step.	Update from Harwood / Ellender.	
4. Pilot test the two preferred bacterial source tracking methodologies in five Gulf estuaries (with varying environmental conditions).			EPA	Mississippi	Louisiana	EPA will provide technical assistance to this action. MS will support pilot testing in an MS estuary. LA will provide in-kind support as resources will allow.		(1) EPA has funded a cooperative agreement with USF, USM, and UWF (PIs are Harwood, Ellender, Wang, and Lepo) to accomplish this step.	Update from Harwood / Ellender.	
5. Evaluate bacterial sources responsible for the contamination of shellfish growing waters in each of the five pilots.			EPA	FDA	Louisiana	EPA will provide technical assistance to this action. FDA will provide results of studies on environmental fates of pathogens and indicators, and can collaborate on traceback studies. LA will participate as resources will allow.	(1) The state shellfish control authority in each state already has sanitary surveys of shellfish growing waters that describe any potential sources of pollution.	(2) EPA has funded a cooperative agreement with USF, USM, and UWF (PIs are Harwood, Ellender, Wang, and Lepo) to accomplish this step. (3) Researchers supported by the MS-AL Sea Grant Consortium at the University of Alabama at Birmingham have developed new, cutting-edge technologies that detect vibrio bacteria in oysters. The process has been adopted by the USFDA and assures customers of a quality product and extends oyster shelf-life up to two weeks.	Update from Harwood / Ellender.	
6. Conduct a final workshop to evaluate the results of pilot studies and prepare a final report.			EPA	Mississippi	Louisiana, USGS, FDA	EPA, via an existing agreement with the University of Southern Mississippi to assist in such actions, will design and implement this workshop. Additionally, EPA, through its oversight regions in the Gulf (Regions 4 & 6), will provide technical assistance to these actions. MS will provide in-kind support and financial assistance. USGS will provide expertise in review of study results and manuscript peer review. FDA will participate in this workshop. LA will participate and attend workshop as resources will allow.		(1) EPA has funded a cooperative agreement with USF, USM, and UWF (PIs are Harwood, Ellender, Wang, and Lepo) to accomplish this step.	Update from Harwood / Ellender.	
7. Equip state laboratories and train state and local personnel in specific bacterial source tracking methods.			EPA	NOAA	Louisiana, Mississippi	EPA will work with state partners to assess the costs necessary to equip their laboratories and train personnel to conduct the selected BST methods. EPA will also assist the states in preparing and supporting financing strategies for the effective implementation of these effects Gulf-wide. NOAA will train state personnel in specific BST methods at the specific request of the Gulf States. (Lead: NOS NCCOS) MS will provide in-kind assistance. LA will participate as resources will allow.				On hold. Must first implement Steps 1-6 to identify appropriate technologies.

WQ-3: Improve government efficiency in water quality monitoring

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Complete	On Track	Not On Track								
36-Month Outcome: Implement a regional pilot effort to coordinate and standardize state and federal water quality data collection activities in the Gulf region for one or more nutrient parameter(s) and/or one or more pathogens. Action Blueprint:										
1. Host an annual Gulf of Mexico Forum for Environmental Monitoring to promote coordination of water quality monitoring by state, local, and federal agencies.			EPA	USGS, USFWS, Mississippi	Alabama, Louisiana, NOAA, MMS	EPA will co-lead and co-sponsor (i.e., resources and administration) the design, development, and implementation of this regional forum. USGS and USFWS will assist in planning and goal setting. MS will provide in-kind support and will participate. NOAA will participate in the environmental monitoring forum, if asked by the Alliance (Lead: NOS NCCOS) MMS will utilize expertise to ensure efforts are consistent and compatible with other ongoing efforts. AL will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow. (Lead: ADEM) LA will participate to the extent practicable in a review capacity and will attend workshops when time and funding allow.	(1) The EPA GMP Monitoring, Modeling, and Research Focus Team coordinates efforts (e.g., sharing information, making recommendations, providing assistance) on monitoring, modeling and research issues in the Gulf of Mexico ecosystem. The Team provides a forum for regular interaction among members of the monitoring, modeling, and research community to assist in the GMP in the application of monitoring data, models, and research findings to support scientific assessments and decision making in response to key environmental issues in the Gulf ecosystem. (2) The five Gulf States have agreed, through their interactions with the GMP, to coordinate their estuarine and coastal monitoring and assessment activities and to investigate the development of a joint Gulf states Coastal Monitoring Program on the measurement of the status and trends of ecological condition in coastal resources. Through its involvement with the GMP and several Gulf state resource agencies, EPA's EMAP is assisting in the development of a framework for this integrated and comprehensive monitoring of Gulf coastal resources.	(3) The WQ and Nutrient PITs will plan a joint Gulfwide monitoring conference in Spring 2007. It is anticipated that Mississippi DEQ will facilitate this workshop, in either Mississippi or at the EPA Gulf Breeze lab, with funding from the EPA GMP. Ray Montgomery (a MDEQ contractor) might be available to assist. Next step is to draft a monitoring conference proposal. (GMP)	(4) As leads for the WQ and Nutrient PITs, FL and MS hosted a Monitoring Parameters Standardization Workshop on July 11, 2007, to initiate planning for a pilot effort to standardize monitoring methods for a core set of nutrient and water quality parameters across the Gulf ecosystem.	(1) EPA GED, in partnership with the EPA GMP, will investigate planning and hosting this workshop (S. Jordon and F. Kopfler). (2) Any effort should be coordinated with a EPA R6 WQ coordination workshop (D. Buzan). Should investigate if R4 does this. If so, hold the two regional workshops together. EPA R6 will look into this possibility (M. Schaub). (3) One goal of the workshop is to have in attendance those State representatives that can "commit" to changes in WQ monitoring and accreditation standards that will result in coordinated monitoring. (4) This forum should also focus on facilitating management actions based on sound, quality, and coordinated WQ monitoring - this is one of the long-term motivations for such a Gulf region WQ monitoring workshop (M.E. Whitworth and D. Buzan).
2. Comprehensively survey state, local, and federal agencies for types of water quality data being collected, methods of collection, analytical methods, quality assurance protocols, proprietary restrictions, and database platforms.			Identification of Lead still pending.	NOAA, USGS, USFWS, Mississippi	Louisiana, USACE, MMS	NOAA will provide data about NERRS System-wide monitoring program including rationale for protocols and quality assurance (Lead:NOS OCRM, NOS NERRS) USGS will contribute significant experience in hydrological monitoring to help coordinate standards and analytical methods. USFWS will contribute environmental contaminants expertise to help coordinate standards and analytical methods. MS will provide in-kind support. USACE can respond to the survey with information on the WQ data collected as part of its studies and projects. MMS will utilize expertise to ensure efforts are consistent and compatible with other ongoing efforts. LA will provide in-kind support as resources will allow.		(1) This survey will be started at the 2007 Gulfwide monitoring conference. (GMP) (2) USGS is considering a leadership role on this step. (D. Lavoie)		(1) After the workshop in WQ3-1, which will define the exact parameter suite involved, existing survey results will be collected and delivered to Steve Wolfe (FL DEP) by 1 representative from each state.

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Complete	On Track	Not On Track								
3. Develop accountability tools and accreditation standards for laboratories performing analyses included in Gulf-wide monitoring databases.			Identification of Lead still pending.	USGS, Mississippi	Louisiana, USACE, MMS, USFWS, EPA, NOAA	USGS will help oversee development of quality assurance and quality control protocols. MS will provide in-kind support. USACE will share recently prepared guidance for quality assurance of water quality laboratory testing with the Gulf team for this action. MMS will utilize expertise to ensure efforts are consistent and compatible with other ongoing efforts. USFWS will collaborate with the States and other Federal agencies. EPA will collaboratively provide policy and technical assistance to this action. NOAA will provide NERR System-wide Monitoring Program standards and protocols for water quality data collection, analysis, and quality control for use as a model (Lead: NOS NERRS) LA will provide in-kind support as resources will allow.	(1) The National Water Quality Monitoring Council / Methods and Data Comparability Board is preparing lists of what are believed to be the necessary or "core metadata" to allow comparability assessments. The proposed lists are not a set of required information but are recommended to help data collectors and data managers more effectively characterize their data and thereby facilitate and promote the use of those data by others.	(1) The development of accountability tools and accreditation standards will be started at the 2007 Gulfwide monitoring conference. (2) USGS is considering a leadership role on this step. (D. Lavoie)		(1) John Macauley, EPA GED, can assist in accreditation coordination discussions with the Gulf states (S. Jordon).
4. Facilitate the selection of a pilot parameter for monitoring coordination and standardization by state and federal water quality agencies and GCOOS (leverage possible linkage to National Water Quality Monitoring Council regional pilot activities).			Identification of Lead still pending.	Mississippi	Louisiana, GCOOS, National Water Quality Monitoring Council, NOAA, USGS, EPA	MS will provide in-kind support. NOAA can lend expertise on standards and protocols for collection, analysis and quality control. The National Monitoring Network design is almost completed and should include operational sites chosen in consultation with Regional Associations, such as GCOOS. (Lead: NOS NERRS with NCCOS participation) USGS will coordinate with other Federal, state, and local participants. EPA will collaboratively provide policy and technical assistance to this action. LA will provide in-kind support as resources will allow.		(1) In August 2006, F. Kopfler contacted Chuck Spooner, NWQMC Co-Chair, about the Alliance's desire to be a pilot. (2) The Alliance is actively encouraging the National Water Quality Monitoring Council (NWQMC) to designate a pilot project in a bay-watershed region of the Gulf of Mexico as a proof of concept of the National Water Quality Monitoring Network Design. This pilot project could greatly advance Gulf-region monitoring coordination and standardization. EPA, USGS, and NOAA are working with several other agencies on a strategy and schedule for the next phase of the National Water Quality Monitoring Network, including the designation of pilot projects. (added 9-20-06) (3) USGS is considering a leadership role on this step. (D. Lavoie)	(4) In March 2007, FL, in close partnership with the other 4 Gulf States and GCOOS, prepared and submitted a proposal for the Gulf region to be one of 3 national pilot geographies through the National WQ Monitoring Council to test their new monitoring design. The Alliance proposal was not selected. (5) As leads for the WQ and Nutrient PITs, FL and MS hosted a Monitoring Parameters Standardization Workshop on July 11, 2007, to initiate planning for a pilot effort to standardize monitoring methods for a core set of nutrient and water quality parameters across the Gulf ecosystem.	(1) Could we use standard sampling and data management techniques for HABs for the Alliance parameter - for example chlorophyll and HABs? Or select a parameter already sampled in all 5 Gulf States? There is also an argument not to try to coordinate a 106 parameter?

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